Title (en)

IMPROVED LINEAR VARIABLE DIFFERENTIAL TRANSFORMERS FOR HIGH PRECISION POSITION MEASUREMENTS

Title (de)

VERBESSERTE LINEARE VARIABLE DIFFERENZÜBERTRAGER FÜR HOCHPRÄZISE POSITIONSMESSUNGEN

Title (fr)

TRANSFORMATEURS DIFFERENTIELS A VARIATION LINEAIRE AMELIORES POUR MESURES DE POSITION DE GRANDE PRECISION

Publication

EP 1340040 A4 20070228 (EN)

Application

EP 01990186 A 20011130

Priority

- US 0148283 W 20011130
- US 25031300 P 20001130
- US 33224301 P 20011116

Abstract (en)

[origin: WO0244647A2] A transducer that reduces noise, increases sensitivity, and improves the time response of a linear variable differential transformer (LVDT). The device replaces the primary coil and the high permeability ferromagnetic core of conventional LVDTs with a primary wound around a moving non-ferromagnetic core. In addition to reducing or eliminating Barkhausen noise, this approach reduced or eliminated a number of other undesirable effects in conventional LVDTs including excessive eddy current heating in the core, non-linearities associated with high permeability materials and the length scale of the flux circuit. These improvements are coupled with improved LVDT signal conditioning circuitry. The device is also an actuator and may be used to convert differential voltages into force. Devices with these improvements have numerous applications, including molecular force measurements, atomic force microscopy and manipulation technology, lithographic manufacturing, nanometer scale surface profiling and other aspects of nanotechnology.

[origin: WO0244647A2] A transducer that reduces noise, increases sensitivity, and improved the time response of a linear variable differential transformer (LVDT). The device replaces the primary coil and the high permeability ferromagnetic core of conventional LVDTs with a primary coil (15) wound around a moving non-ferromagnetic core (14). In addition to reducing or eliminating Barkhausen noise, this approach reduced or eliminated a number of other undesirable effects in conventional LVDTs including excessive eddy current heating in the core, non-linearities associated with high permeability materials and the length scale of the flux circuit. These improvements are coupled with improved LVDT signal conditioning circuitry. The device is also an actuator and may be used to convert differential voltages into force. Devices with these improvements have numerous applications, including molecular force measurements, atomic force microscopy and manipulation technology, lithographic manufacturing, nanometer scale surface profiling and other aspects of nanotechnology.

IPC 8 full level

G01D 5/22 (2006.01); **G01B 7/14** (2006.01); **H01F 5/00** (2006.01); **H01F 21/04** (2006.01)

CPC (source: EP KR US)

B82Y 35/00 (2013.01 - US); **G01B 7/14** (2013.01 - KR); **G01D 5/2066** (2013.01 - EP US); **G01D 5/2291** (2013.01 - EP US); **G01Q 10/04** (2013.01 - EP US); **H01F 21/04** (2013.01 - EP US)

Citation (search report)

- [X] US 4030085 A 19770614 - ELLIS JAMES F, et al
- [X] SYDENHAM P H ET AL: "Low-cost, precision, flat inductive sensor", MEASUREMENT, INSTITUTE OF MEASUREMENT AND CONTROL. LONDON, GB, vol. 15, no. 3, June 1995 (1995-06-01), pages 179 - 188, XP004040417, ISSN: 0263-2241
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DOCDB simple family (publication)

WO 0244647 A2 20020606; **WO 0244647 A3 20030116**; AU 2905002 A 20020611; CN 1483136 A 20040317; EP 1340040 A2 20030903; EP 1340040 A4 20070228; JP 2004523737 A 20040805; JP 2008102144 A 20080501; KR 100794976 B1 20080116; KR 20030084903 A 20031101; US 2002175677 A1 20021128; US 2004075428 A1 20040422; US 2006186876 A1 20060824; US 2006186877 A1 20060824; US 2006186878 A1 20060824; US 2006192551 A1 20060831; US 2006202683 A1 20060914; US 2007200559 A1 20070830; US 7038443 B2 20060502; US 7233140 B2 20070619; US 7262592 B2 20070828; US 7271582 B2 20070918; US 7372254 B2 20080513; US 7459904 B2 20081202

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